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Heraeus
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Kendro®

Clinifuge 120V 60 Hz SERVICE MANUAL

P/N 12003539

Update Parts List Feb '02

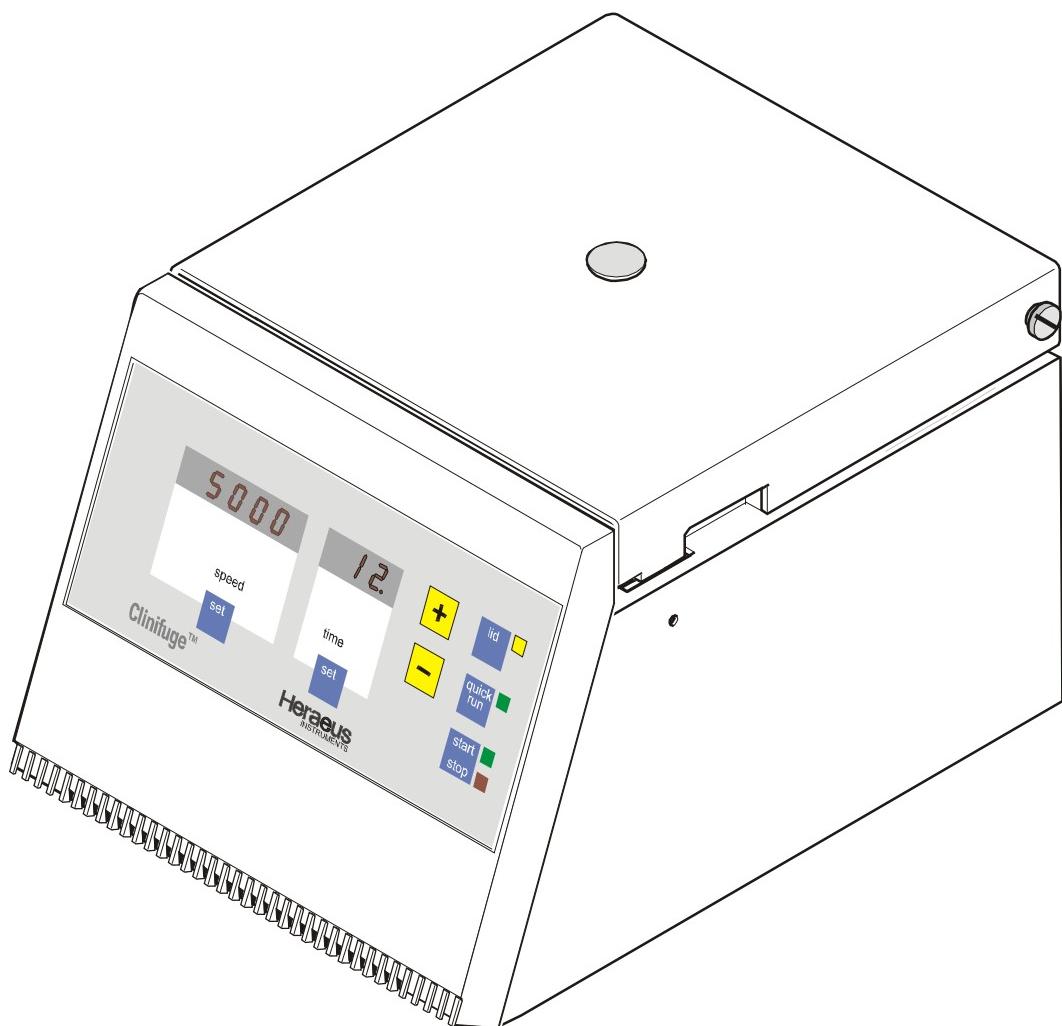


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CLINIFUGE® COMPACT CENTRIFUGE

Easy to Use

The Heraeus® Clinifuge is functional and sophisticated with an ergonomic design. It is ideal for use in medical practices, clinical and small laboratories and as a stand-by unit in large laboratories.



◀ Clinifuge

Maintenance free

The Clinifuge is equipped with a brushless motor, so there is no need to replace carbon brushes. Beside saving time and money, this also ensures clean operating conditions.

Accessories

The Clinifuge comes complete with an adapter set and an autoclavable rotor. Made of impact resistant, fiber glass reinforced polyamide, this rotor offers high stability and outstanding run characteristics.

It is easily removed for cleaning in the laboratory washing machine. An extensive range of adapters permits centrifugation of all standard 5, 7, 10 and 15 ml tubes, including the popular "Monovette", "Vacutainer" and "VenoJect" blood collection tubes.

Safety

Samples processed in today's laboratories often harbor unknown risks. The Clinifuge complies with international safety standards and is equipped with a lid lock, lid interlock and steel armoured guard ring.

Benefits

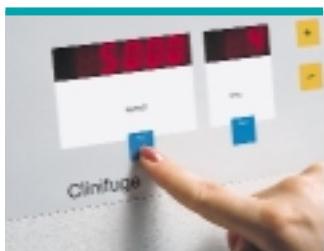
- Easy to Use
- Able to run wide range of most popular medical tubes
- Maintenance free
- Safe

Functions

The microprocessor controlled Clinifuge is equipped with bright digital displays and touch-pad keys for quick and easy setting of speed and run-time. The values last used are stored. To repeat a run, simply press the start key.

It is also designed with a user friendly self diagnosis system which indicates faults directly on the display.

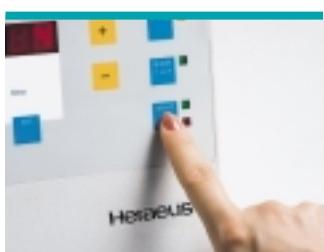
TECHNICAL DATA



Set the required speed...



...and set the required time



With the "start" button, repeat runs can easily be recalled

Clinifuge	120 V version
Description	Microprocessor controlled table top centrifuge
Maximum speed (rpm)	5000
Minimum speed (rpm)	1600
Maximum RCF (x g)	2600
Minimum RCF (x g)	270
Maximum capacity (ml)	12 x 15 (glass)
Controller	Microprocessor controller for time and speed
Drive	Brushless induction motor, microprocessor controlled
Runtime	1–99 min. and continuous operation (Hold)
Program memory	Stores values last entered, unlimited
Safety	Lid lock and lid interlock, steel armoured guard ring
Design	Fibre glass reinforced polyamide housing with high noise and vibration insulation properties
Dimensions (H x W x D) (mm / inch)	240 x 284 x 375 / 9.5 x 11.2 x 14.8
Weight (incl. rotor) (kg / lbs)	Approx. 10.7 / 23.5
Power consumption (W)	65

ORDER NUMBERS

Model	Order No.				
Clinifuge	120 V; 60 Hz 75003539				
Accessories for Clinifuge					
Angle rotor¹⁾	75003760				
Max. speed (rpm)	5000				
Max. RCF (x g)	2600				
Max. capacity (ml)	12 x 15				
Max. radius (cm)	9.65				
Acceleration time (sec)	40				
Braking time (sec)	45				
Accessories for angle rotor 75003760					
Tube volume (ml)	Type of tube	Dimension (mm) Diam. x Length	Tubes per rotor	Type of adapter	Adapter Order No.
7	Glass tubes (DIN)	12 x 100	12	yellow	75003227 ¹⁾
15	Glass tubes (DIN)	16 x 100	12	⁴⁾	—
3-5	VenoJect II (Terumo)	13 x 75	12	cream + rubber pad	75003227 ¹⁾
7	VenoJect II (Terumo)	13 x 100	12	yellow	75003227 ¹⁾
9-10	VenoJect II (Terumo)	16 x 100	12	sleeves	75003763 ³⁾
3-5	Vacutainer (BD) ²⁾	13 x 75	12	cream + rubber pad	75003227 ¹⁾
7	Vacutainer (BD) ²⁾	13 x 100	12	yellow	75003227 ¹⁾
7	Vacutainer (BD)	16 x 75	12	sleeves + rubber pad	75003763 ³⁾
10	Vacutainer (BD) ²⁾	16 x 100	12	⁴⁾	—
15	Vacutainer (BD)	16 x 125	6	⁴⁾	—
4	Sarstedt Monovette	11.5 x 83.5	12	cream	75003227 ¹⁾
5	Sarstedt Monovette	13 x 90	12	cream	75003227 ¹⁾
7.5	Sarstedt Monovette	15 x 92	12	⁴⁾	—
9	Sarstedt Monovette	16.5 x 92	6	rubber pad	75003762
12 (Urine)	Sarstedt Monovette	16.5 x 101.5	6	⁴⁾	—
Urine tubes	BD, Terumo	16 x 100	12	sleeves	75003763 ³⁾

¹⁾ included with centrifuge

²⁾ tube incl. Hemoguard cap

³⁾ included with rotor

⁴⁾ not necessary

The adapter set 75003227 will contain the yellow and cream adapters and rubber pads.

For Ordering or Technical Information

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2.1 Servicing Schedule (yearly procedure recommended)

2.1.1 Maintenance Routine without Dismantling the Centrifuge

2.1.1.1 Electrical Installation and Safety

- Switch OFF the centrifuge and disconnect the unit from power, check voltage supply and mains fusing (16 Amps, slow blow characteristic)
- Check condition of plug and wall socket - (let) replace defective parts
- Check cord condition and fixing / connection - replace or refit it

2.1.1.2 Location and Mechanical Installation

- Check the base (ground, table, lorry with lockable wheels etc.) For resonance-free and stable conditions
- Check for a well ventilated place and sufficient distances to walls or adjacent equipment, without exposure to direct sunlight
- Check the leveling of instrument (use a spirit level)

2.1.1.3 Lid Locking Mechanism and Safety

- Connect the centrifuge to power and switch ON
- Check for easy lid closing and self-acting lid opening - if in disorder, readjust lid's swivel hinge and/or lock assembly
- Check the central rubber gasket for lid sealing and replace it, if damaged
- For checking the safety: start the centrifuge, let it shortly run and stop it, the lid must not be unlocked by the microprocessor until the "end" message is shown on the display - if safety circuit is out of function, replace the main board

2.1.1.4 Cleanliness of Spin Chamber and Motor Casing

- Open the lid and remove the rotor (for loosening turn the central winged nut anti clockwise from the motor shaft)
- Clean the spin chamber with a dry and absorbent cloth (remove all dust and moisture - see also 2.5 Cleaning)
- Check the cleanliness of the motor casing and take care of the annular slot around the motor shaft: **penetrating fluids can damage the upper motor baring**, remove fluids with an injector and/or absorbent paper

2.1.1.5 Rotor and Accessories Condition and Sealing

- Check the condition of rotors and accessory parts (especially all supporting or stressed partitions): the rotor and/or accessory parts must not be used any longer, if there are visible traces of mechanical damage

2.1.1.6 Rotor Fixing and Motor Shaft

- Check the trouble-free condition of the locking nut and replace it in case of malfunction
- High performance rotors made of plastic have a limited service life. Due to safety reasons they have to be exchanged after 10,000 cycles or after being in use for five years. The expiry date can be seen on the date clock in the rotor lower shell. The two-digit number in the middle represents the year and the arrow points to the expiry month. The number of cycles may be checked at any time by closing the lid and keeping both "set" keys pressed. The accumulated rotor cycles will be displayed in the speed display.
- Check the condition of the drive motor shaft: the centrifuge must not be used any longer, if the drive shaft is damaged (bend, thread is worn out, horizontal grooves etc.)

2.1.1.7 Temperature Level

- Check the air inlet underneath the lid and under the bottom plate for free ventilation, insufficient air flow will lead to temperature rise of rotor, motor and electronic parts

2.1.2 Maintenance Routine after Dismantling the Centrifuge Casing

2.1.2.1 Motor Supporting Elements

- Check the supporting and damping elements of the drive motor and replace them in case of increased rubber abrasion or abundance of imbalance but at least every 3 years

2.1.2.2 Braking Circuit

- Check the function of the braking circuit (even brake effect)

2.1.2.3 Lead and Screwing Connection

- Check the terminal and plug connections of all leads and on all boards and electrical components, tighten all loosen screwing connections, refit or replace defective parts
- Check the screwing connections of all boards, mechanical and electrical components and retighten them if necessary (use screw locking lac for motor mounts and lid lock assembly)

2.1.2.4 Protection Earth Core and Grounding Connections

- Check the protection earth core for continuity and all grounding plug connectors
- Check isolation resistance and accessible current (see 2.5)

2.2 Trouble Shooting

Error Indication	Error Cause	Possible Error Source	Corrective Procedure
Displays remain dark	No mains voltage supply	Mains fuse or circuit breaker failed	Check fuse or circuit breaker, replace or switch on again
		Defective mains cord	Check instrument cord, replace defective parts
		Defective unit fuse or fuses on main board	Replace it, if fuse blows again, disconnect electrical parts, otherwise replace main board
	No low voltage supply	Faulty connection from indication to power board	Check connections on CPU, indicat. Board and connecting leads, replace defective parts
		Faulty indication or power board	Replace main board
Displays are illuminated, but drive doesn't start	Motor over-temperature switch has tripped	Motor temperature is higher than 120°C	Let motor cool down, then check temperature switch and leads with Ohmmeter
	Rotor didn't turn	Rotor is jammed	Check for easy rotor movement, remove any jamming objects
		Motor is jammed	Replace motor
	Motor didn't start	Connections inter drive and main board	Check terminal and lead connections, replace faulty parts
		Defective drive	Check resistance of motor windings, replace faulty parts
		Faulty condenser	Replace condenser
		Faulty main board	Remove main board completely and replace it
Drive makes noises-no good separation result	Mechanics	Wear out of motor rubber mount	Replace motor rubber mounts
		Motor bearing	Change motor completely
	Electrical	Defective terminal connection, faulty lead or motor winding	Check voltage on motor terminal and winding resistances -see test points on boards
		Defective driving	Replace main board
Drive doesn't decelerate	No brake current	Faulty main board	Remove main board completely and replace it
Lid cannot be opened by key pressure at standstill	Lid coil is not or not sufficiently supplied with voltage	Missing mains voltage	Remedy see above, manual opening only at standstill
		PTC resistor has released	After a waiting time of 1-2 minutes press key again
		Faulty driving or triac circuit	Replace the complete main board
	Faulty lid coil	Faulty winding of coil	Replace complete lid lock
	Lid is not correctly locked	Lid bolt is jamming	Push lid into lock and press the key again
		Lid is deformed or disadjusted	Readjust the lid centrically

Trouble Shooting

Error Indication	Error Cause	Possible Error Source	Corrective Procedure
“LId” message appears in speed display	Lid was opened manually during run	Forbidden intervention Emergency opening can only be used at standstill	Close lid immediately, turn power off/on, wait for termination of br phase until end message appears
	Protection circuit (15V) for lid control was interrupted during the run	Defective micro switch or leads or connectors to micro switch are interrupted	Check leads and connectors to micro switch, in case of a faulty micro switch, replace lid lock device completely
“OPEN” message in speed display	15V supply circuit is interrupted at standstill	Defective micro switch or leads or connectors to micro switch are interrupted	Check leads and micro switch
“br” message appears in speed display	Rotor comes to standstill without braking force	Short interruption of mains supply	Wait for rotor standstill (appr. 75 seconds) and re-start
„E-“ „ 2“ message appears in speed field	Maintenance counter expired	Rotor has reached 10000 cycles	Replace rotor, NV-Ram and motor supports (Service Kit)
„E-“ „ 3“ message appears in speed field	No brake current	Faulty main board	Remove main board completely and replace it
„E-“ „12“ message appears in speed field	Checksum error of NV-RAM	NV-RAM is not initialized or false	Check NV-RAM and socket, insert the correct NV-RAM
	Disturbed data transfer from NV-RAM	Faulty main board	Remove main board completely and replace it
All dots in the display are illuminated	Maintenance counter expired	Rotor has reached 10000 cycles	Replace rotor, NV-Ram and motor supports (Service Kit)

2.3 Test Points

Test Points	Unit value	Conditions
Mains terminal XA	120V AV	All given voltage and current values refer either to 120V ($\pm 10\%$)
Lid micro switch Plug XB	160V DC	Voltage drop by open lid at 120V units
Terminal XC Motor voltage	approx. 58V AC 105V AC 120V AC 80V AC 75V AC	Rotor #3760 not loaded, in each case measured after reaching the selected speed 1600rpm 4000rpm 5300rpm at the beginning of the braking phase at the end of the braking phase
Motor current IM	Approx. 1,2A 1,2A 0,8A 3,3A 2,0A	Rotor #3760 not loaded, in each case measured after reaching the selected speed with a soft iron or digital effective measuring instrument 1600rpm 4000rpm 5300rpm maximum during acceleration maximum during braking phase
Motor windings resistance 20°C -insulation value	14,6Ω 14,6Ω $> 10M\Omega$	switch OFF unit, pull off motor plug mains winding (black – green) auxiliary winding (black – yellow) resistance inter each phase and motor casing
Lid solenoid terminal XD	29Ω	switch OFF unit, resistance at 20°C (68°F)

2.4 Cleaning of Instrument Parts

ATTENTION - WARNING!

The electrical and electronic components must not be cleaned with moist detergents!

For Cleaning the centrifuge housing or its accessories see Operating Instructions section 1 (maintenance and care).

- **Electronic components**

Clean dusty components carefully with a dry and soft brush and remove loose dust with a vacuum cleaner

- **Vent holes**

Remove dirt from vent holes of front panel or bottom plate using a brush and vacuum cleaner

2.5 Electrical Safety Check

ATTENTION!

A final electrical safety check must be performed after each maintenance and/or repair!

- **Resistance check of protective conductor**

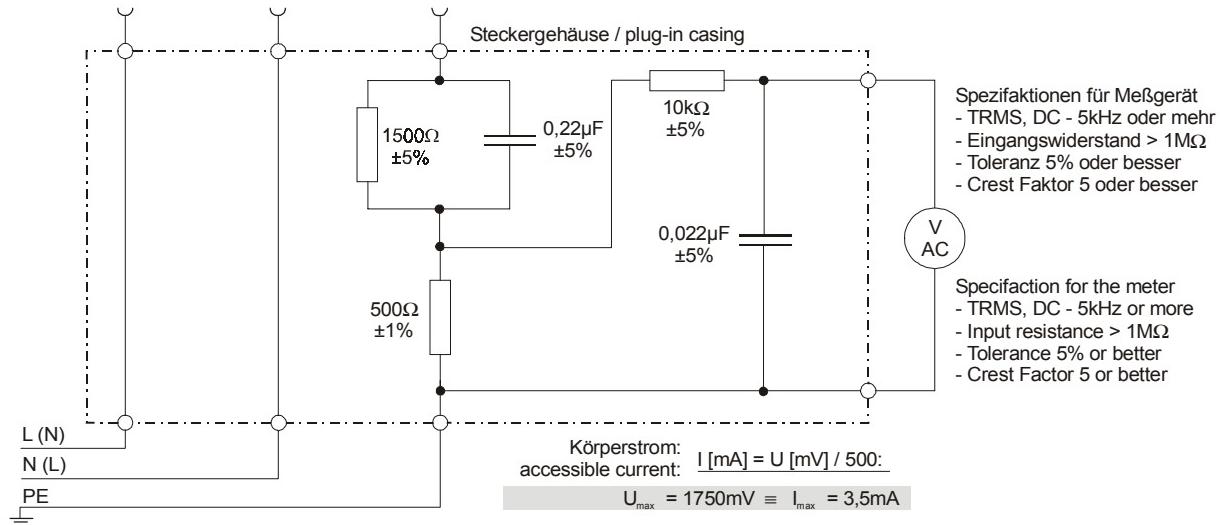
The measuring value of the resistance between the mains plug's grounding pin and the grounding conductors of the motor, electronic chassis and the casing must not exceed 200 mΩ.

- **Insulation resistance Check**

Check also the insulation resistance between the poles of the mains plug and the grounding conductor; the resistance value must be more than 2 MΩ.

- **Accessible current measured to EN 61 010**

The accessible current must not exceed 3.5 mAmps in single fault condition (interrupted protection earth wire)! In accordance with the EN61010, IEC1010 and UL3101 such a fault condition can be reproduced by the following measuring circuit.



3 Functional Description

3.1 Block Functions

The Clinifuge is a microprocessor controlled laboratory tabletop centrifuge with induction drive motor and integrated air cooling system.

The unit incorporates following boards and components (see block diagram 4-1):

- Main board 14 or main board 178 with microprocessor part and power electronics
- Key and indication board (programming: MEGACONTROL simple), part of the main board
- 1 phase induction motor with phase shift capacitor and integrated thermal over temperature switch (C. O. 125°C)
- Double lid lock assembly with solenoid and integrated micro switch (mechanical bolt keeper, magnetically dislocking), attached in front on both sides of the vessel

3.2 Main Board Functions

The main board 14 / 178 is mounted completely behind the front panel. The components on main board are arranged in following groups (see wiring diagram page 4-2).

- Board fusing (2 x 6.25 Amps. slow blow feature)
- Noise filter
- Power pack for low voltage supply of microprocessor part and power electronics (potential separated by transformer)
- Triac control circuit for lid solenoid (DC supply via bridge rectifier)
- Bridge rectifier for DC intermediate circuit supplying brake path and frequency converter
- Microprocessor part with CPU
- Exchangeable NV-RAM containing specific data of the unit

3.2.1 Power Pack

The power pack (transformer, bridge rectifier and voltage regulator) generates:

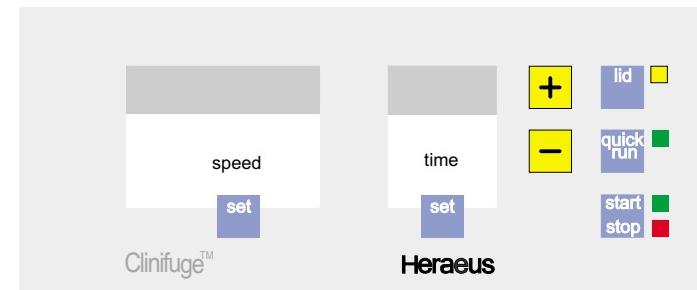
U1 = 5V: supplies central processor, key and indication board reference potential: protective conductor (GND)

3.2.2 Intermediate Circuit with Brake Path and Frequency Converter

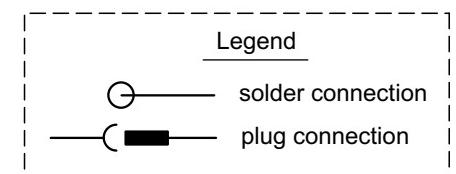
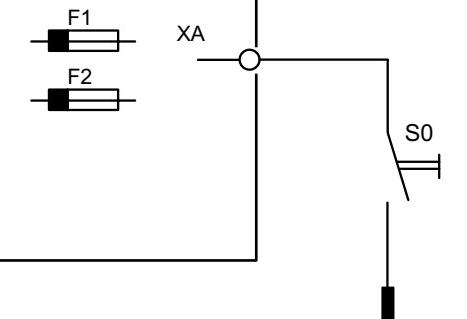
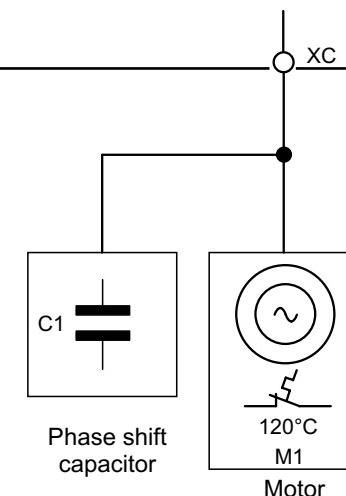
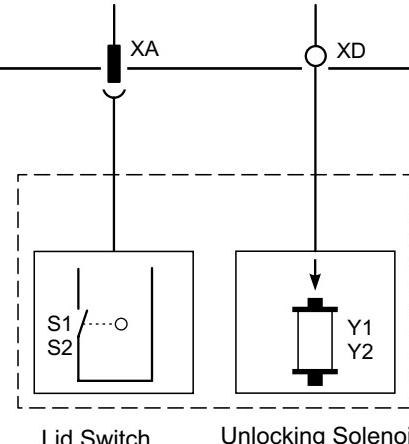
The DC intermediate circuit serves as an energy store between the AC power input and the transmitted motor performance. The intermediate circuit consists of a bridge rectifier (4 diodes) and two serial connected reservoir capacitors. The intermediate circuit is over voltage protected.

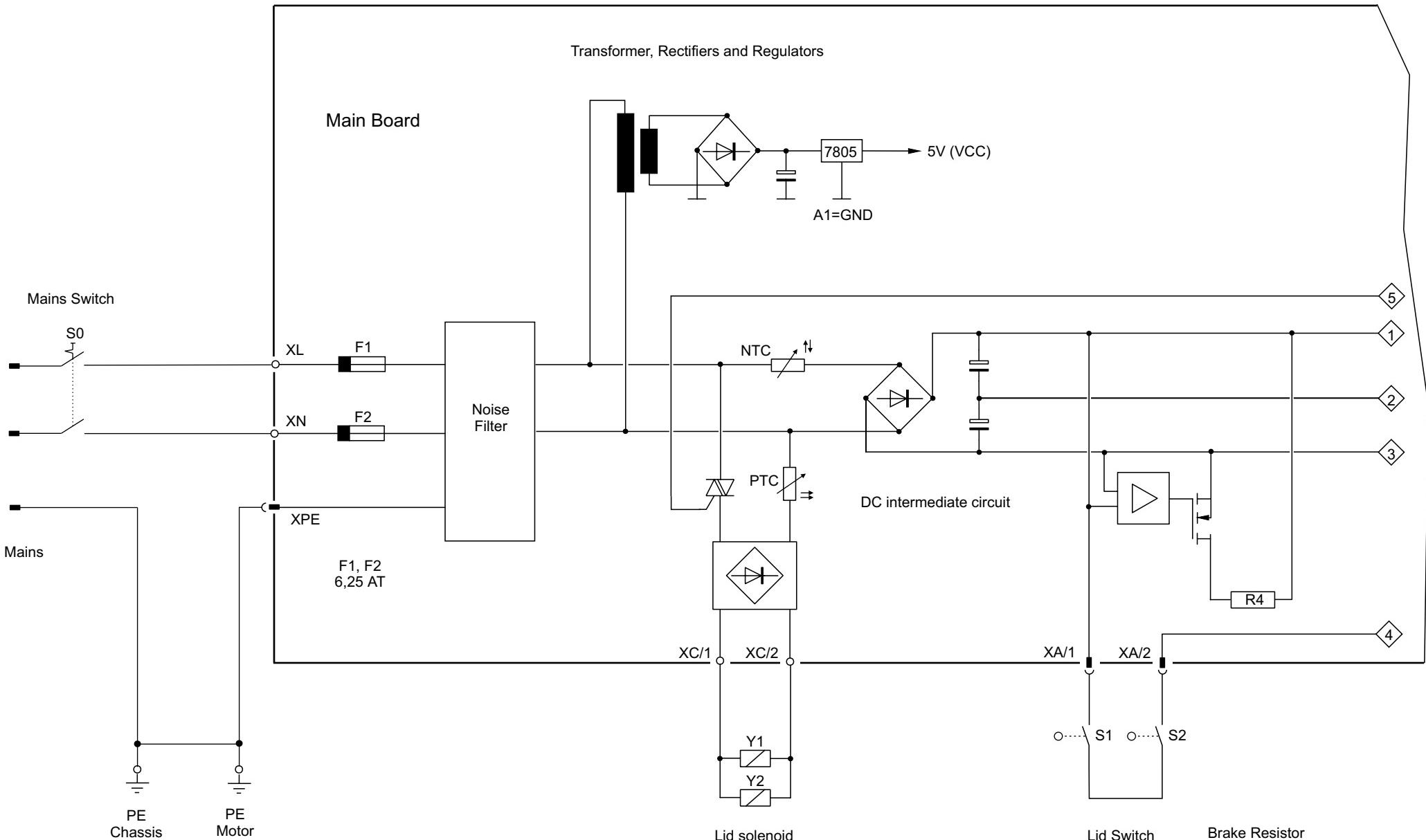
Main Board (Controller, Key and Indication Part)

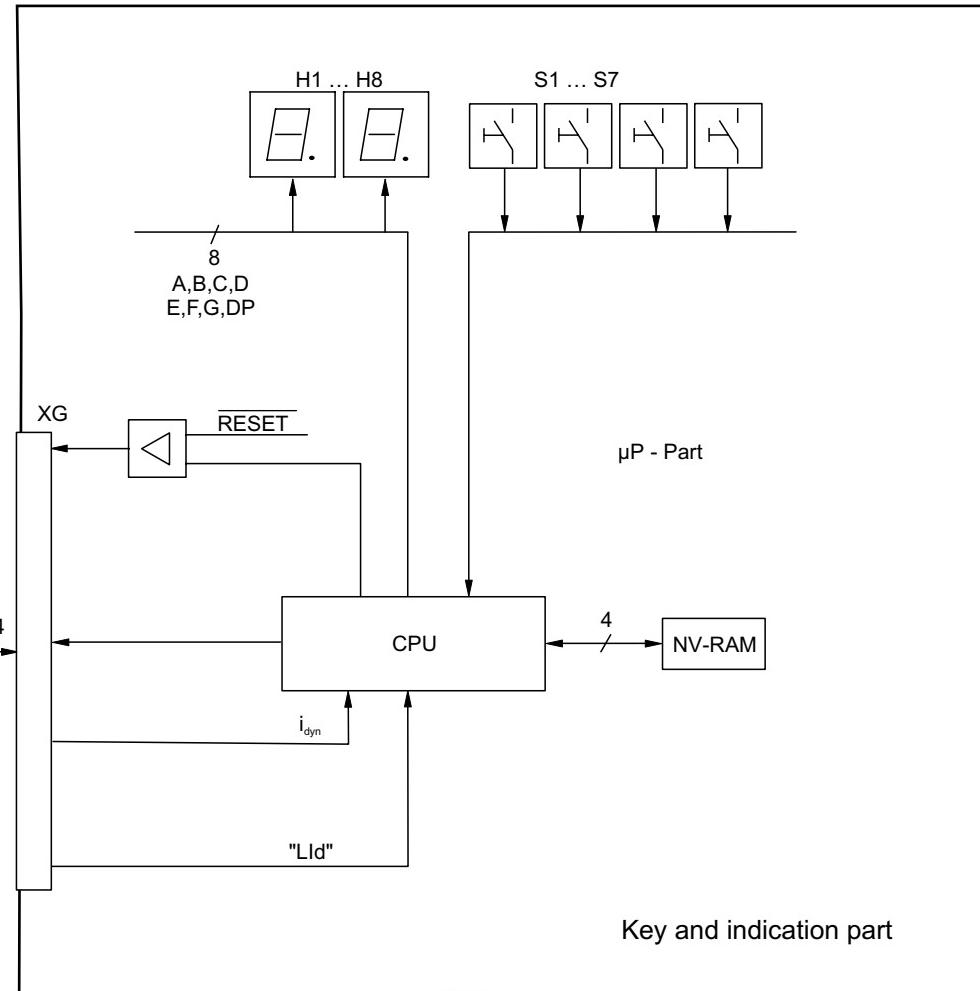
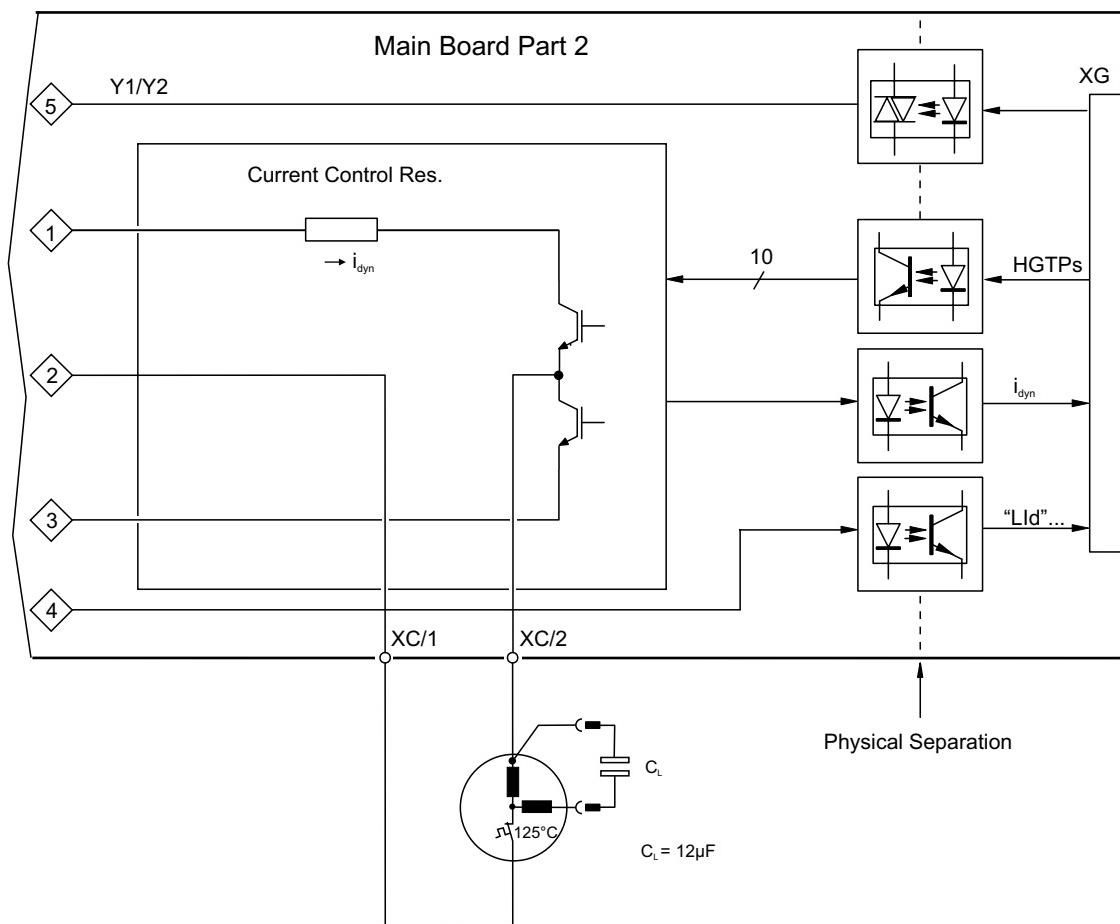
NV-RAM

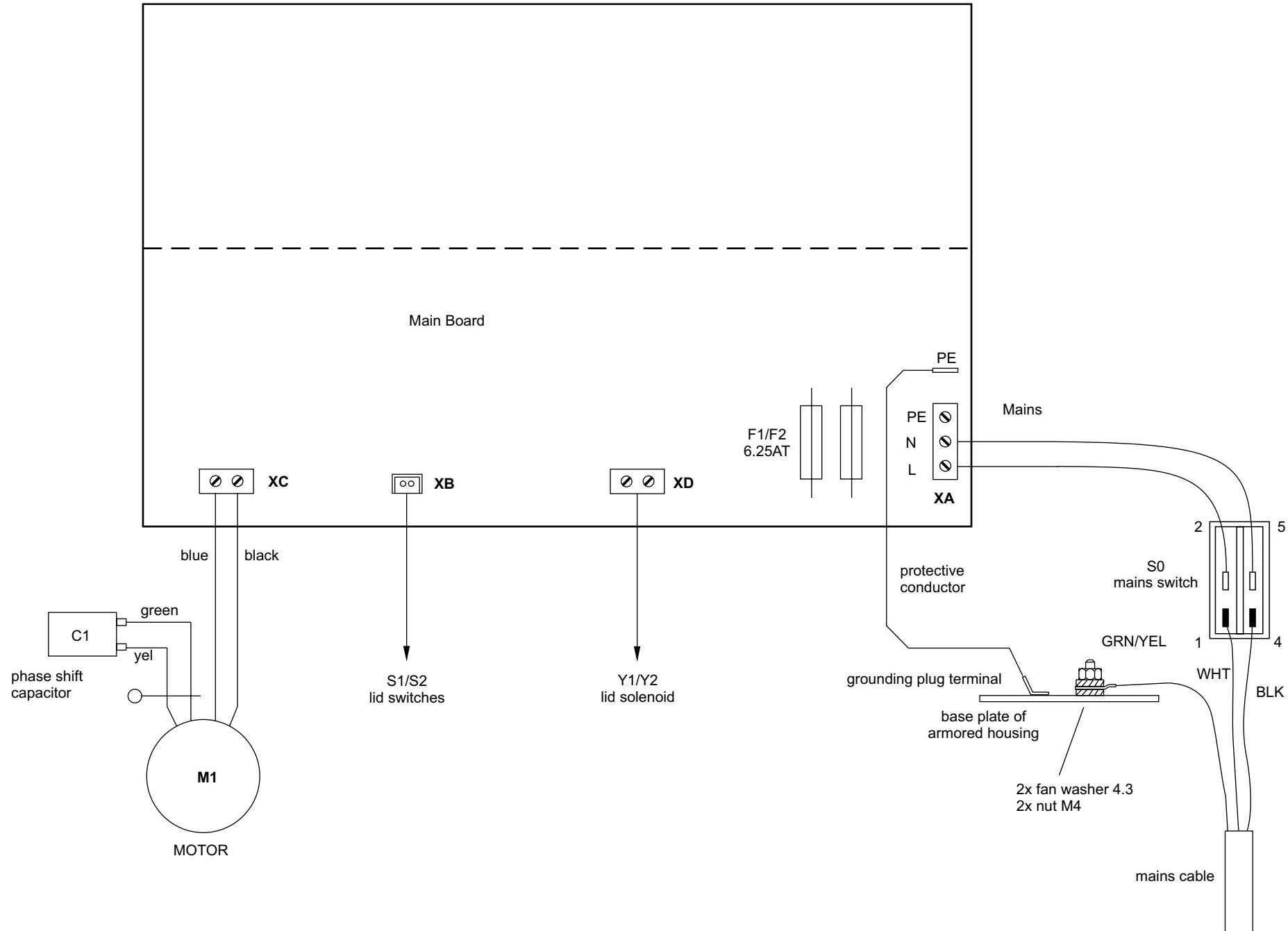
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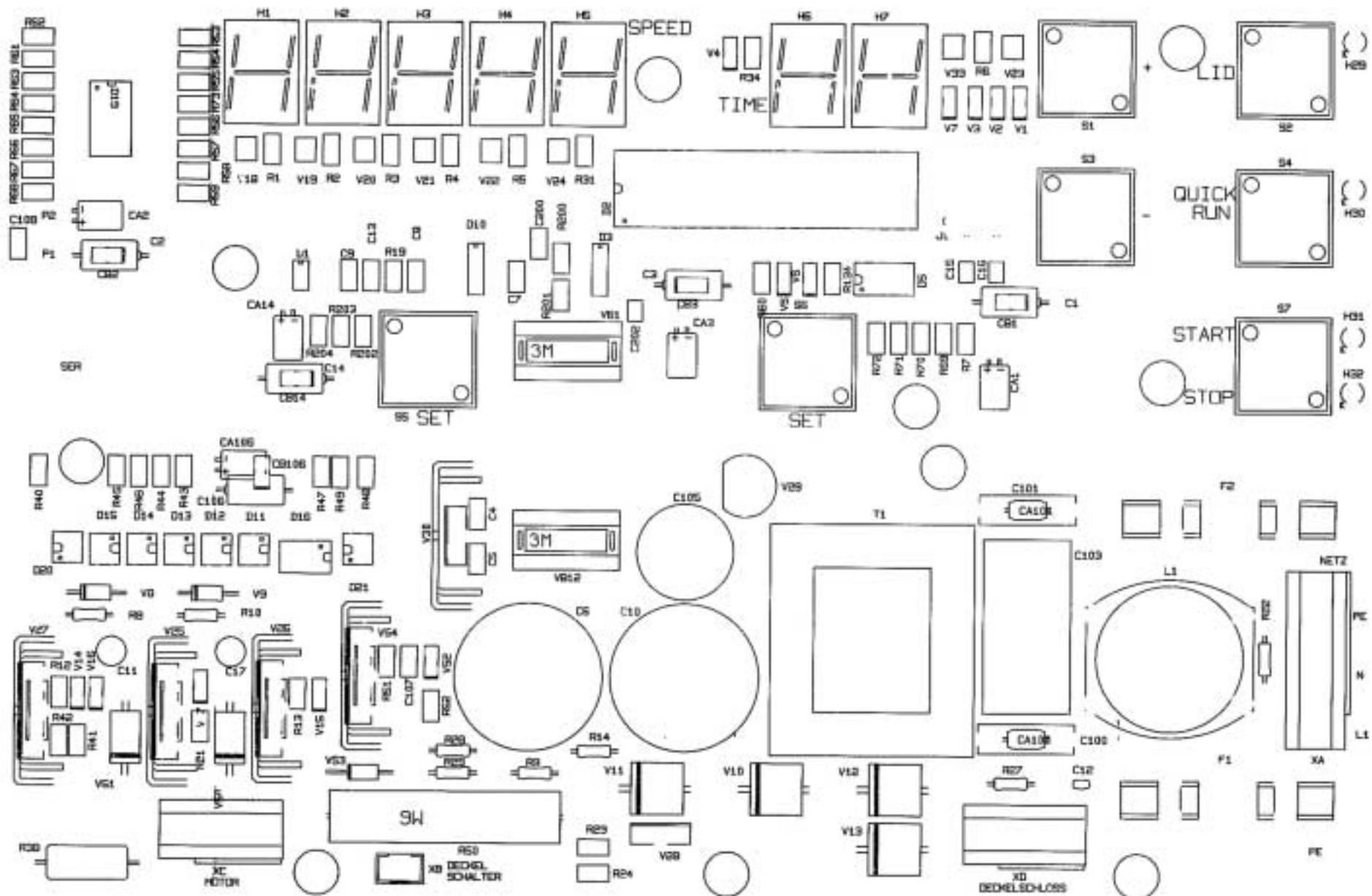
Main Board (Power Electronics)

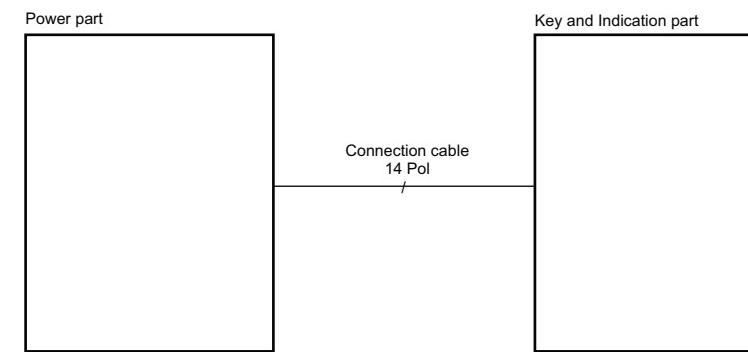


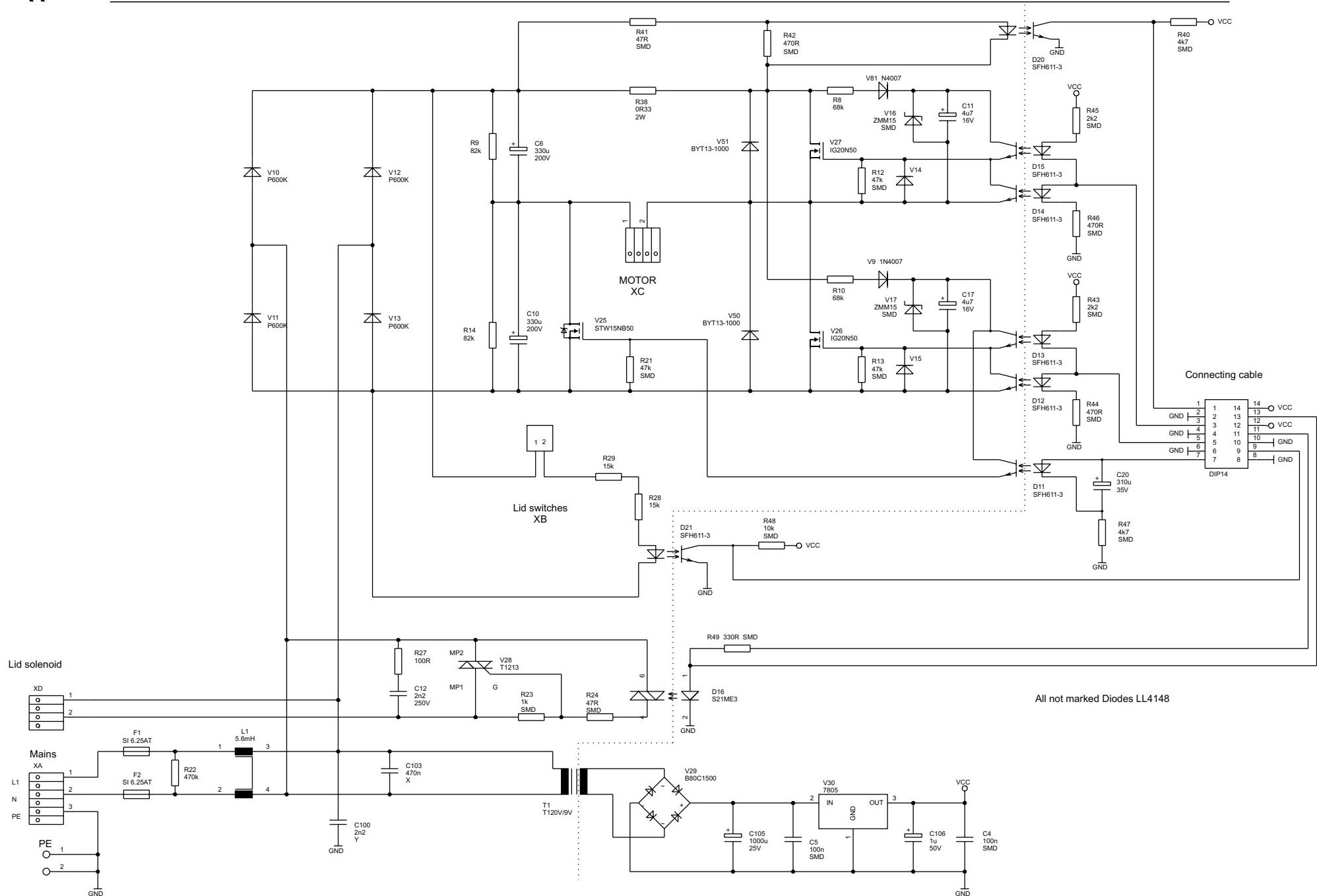


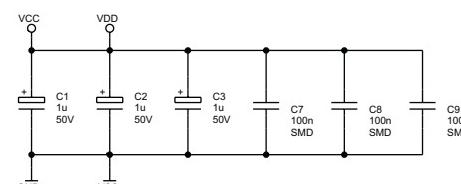
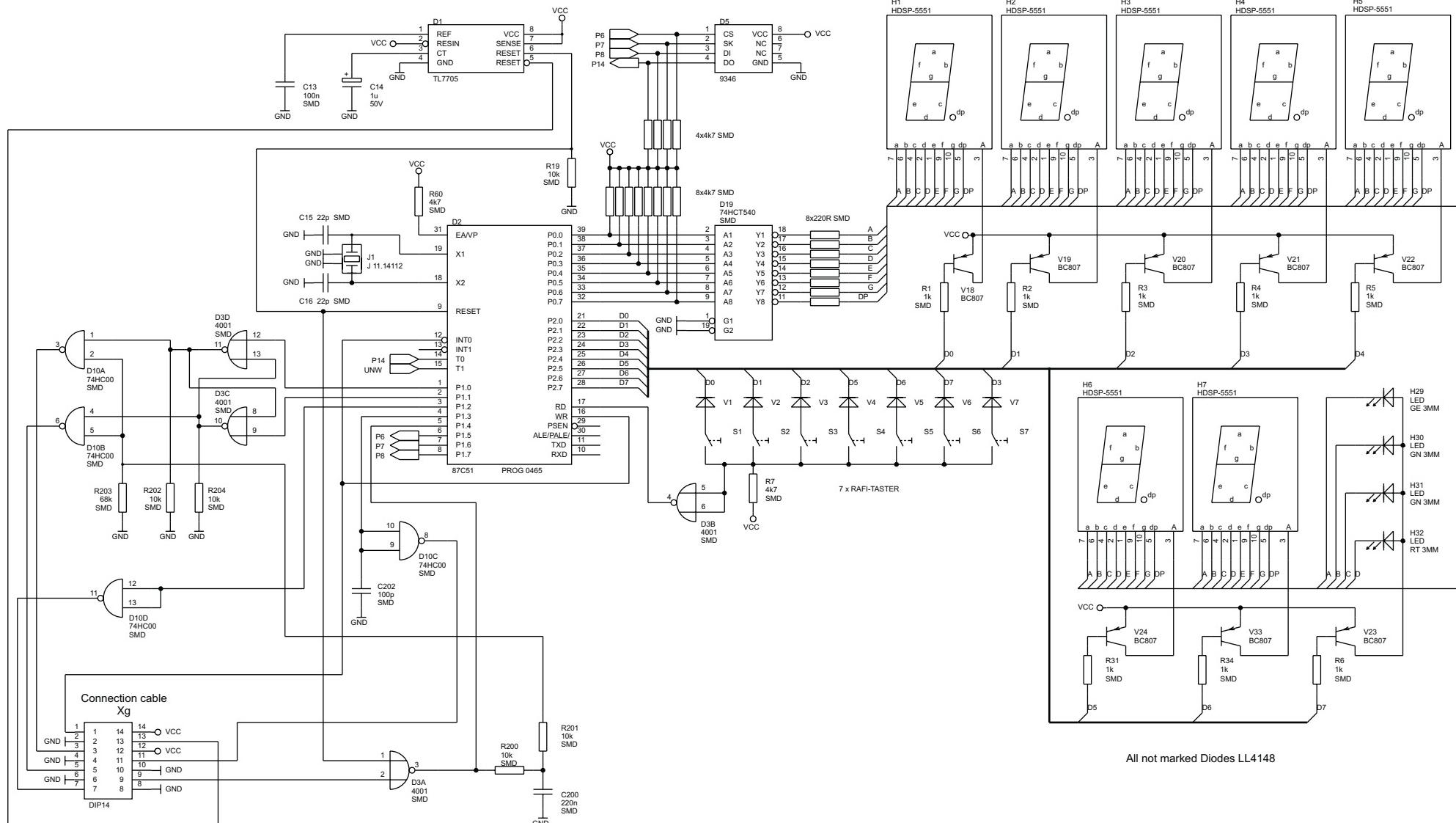


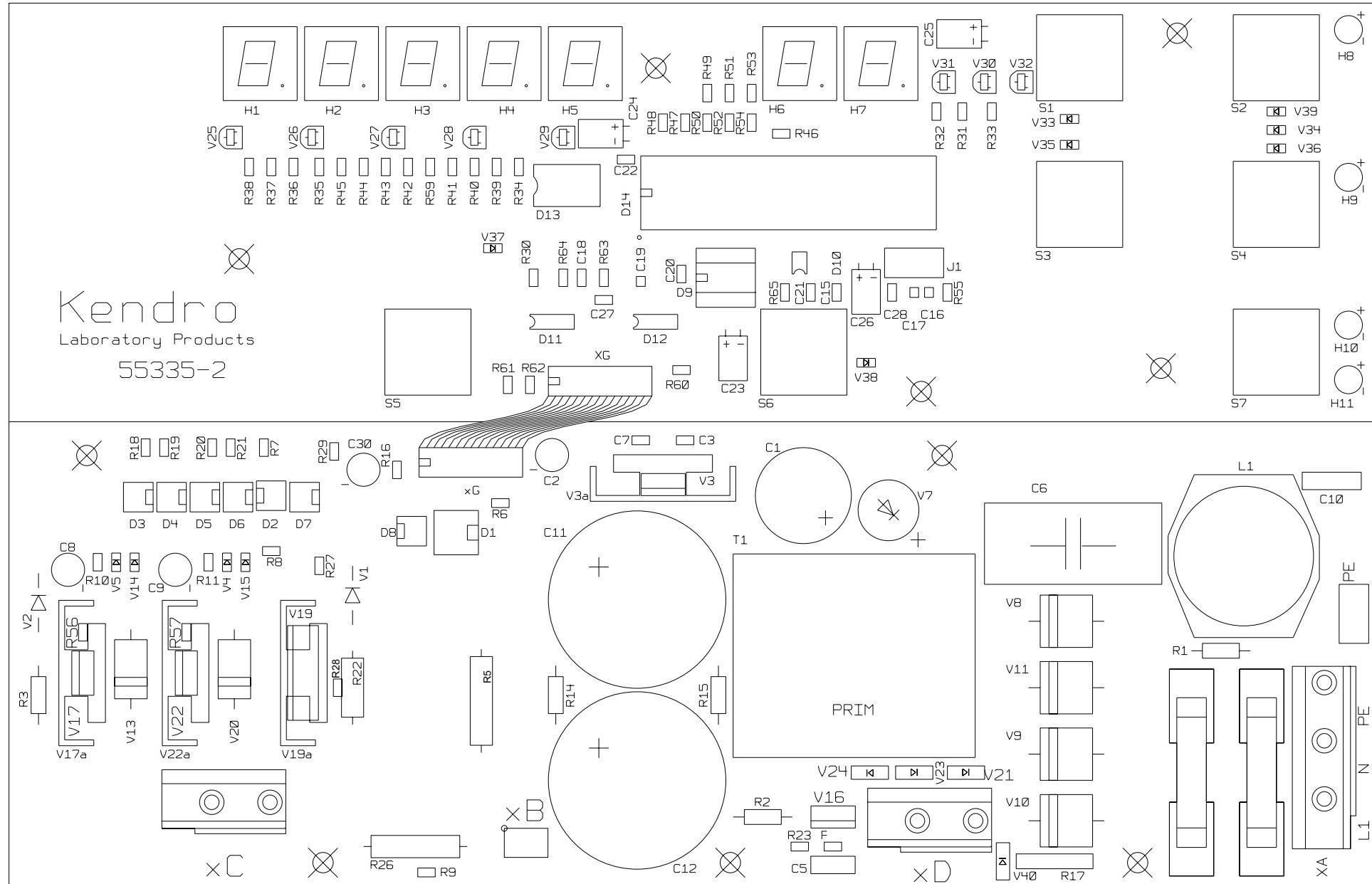


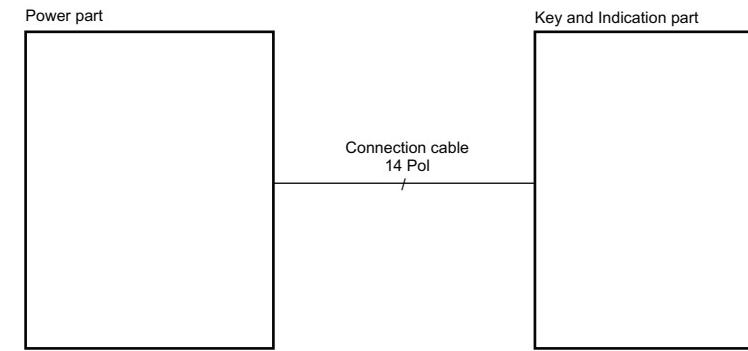


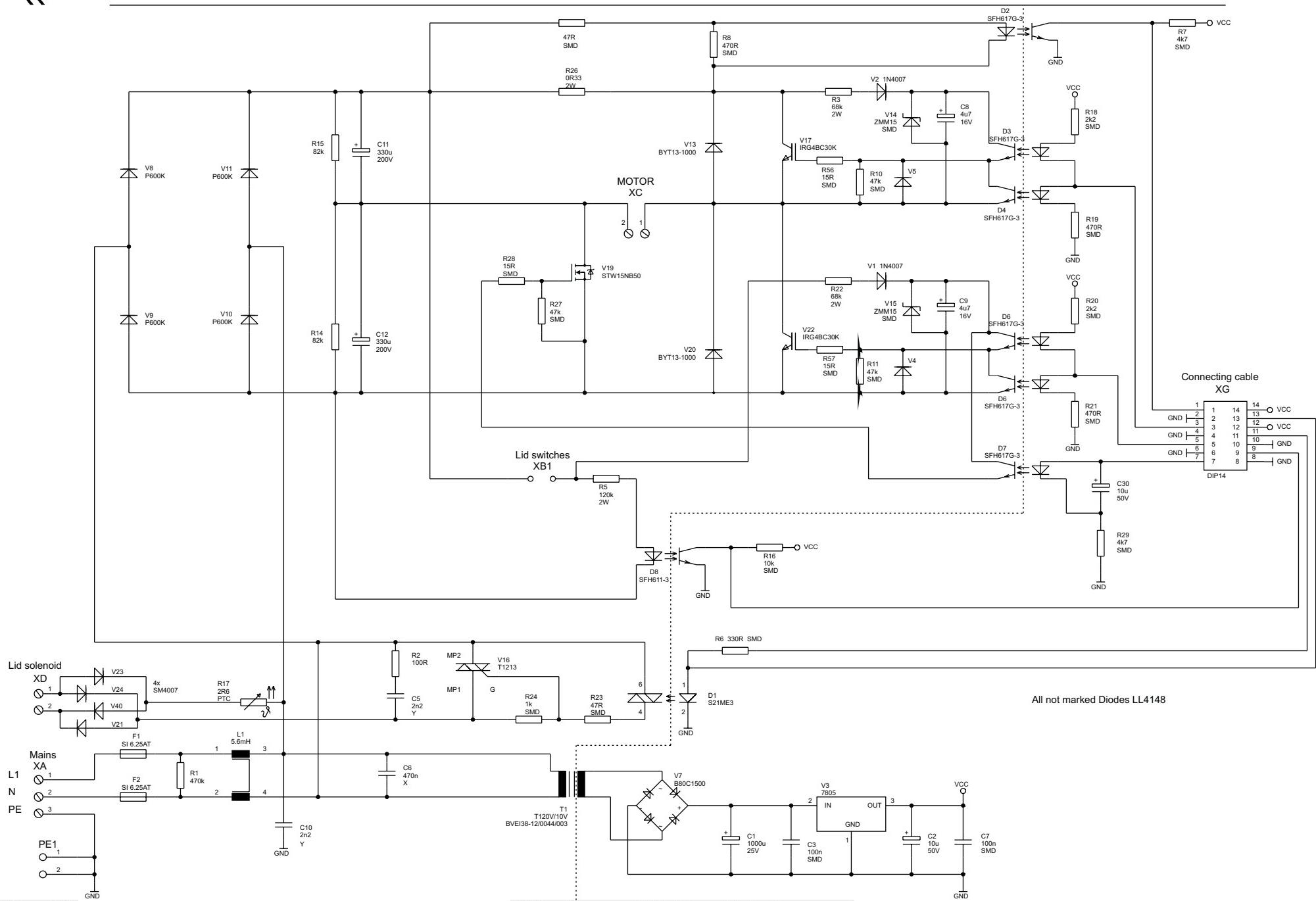


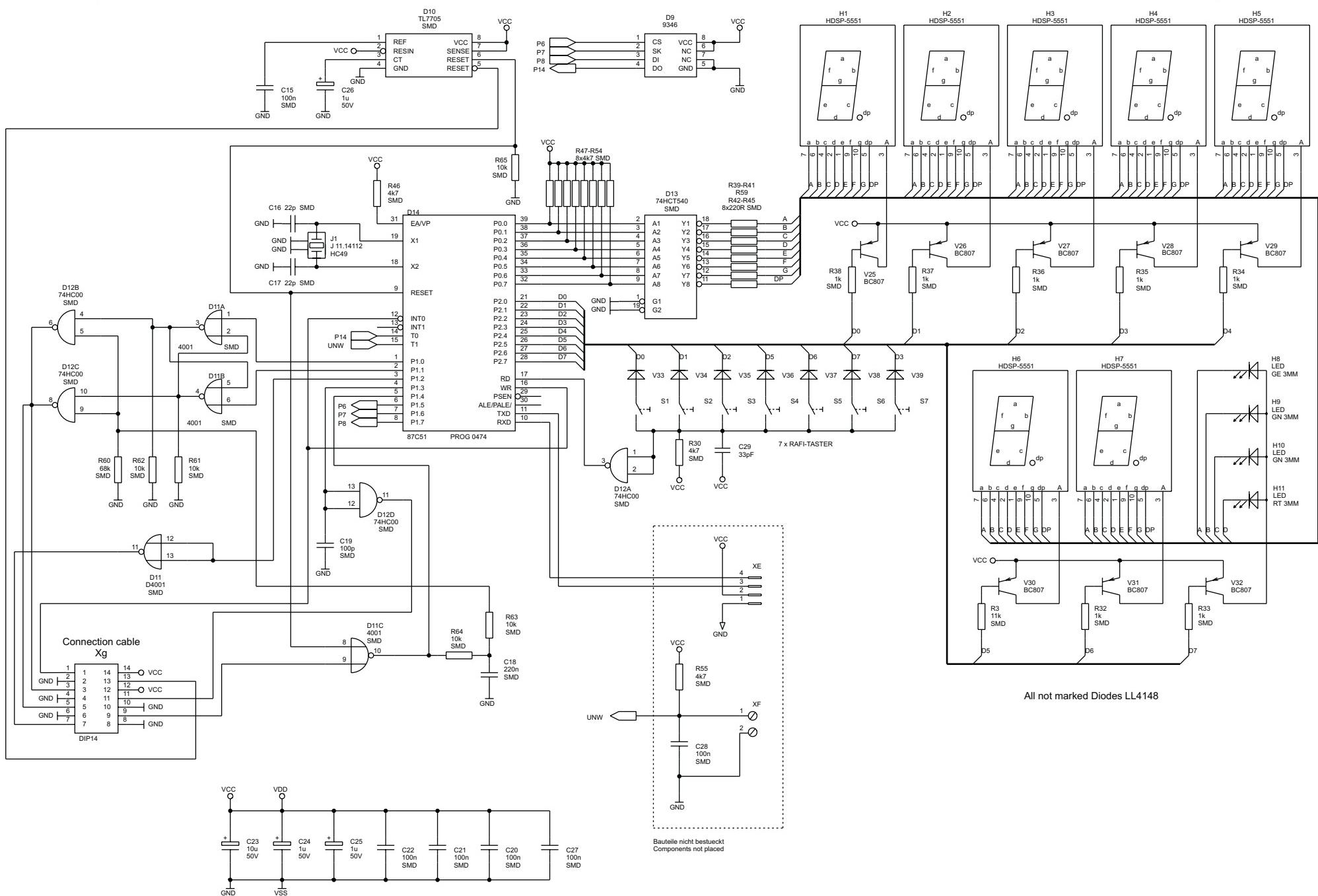












The index numbers stated in () reappear within the breakdown drawings and the spare part lists.

5.1 Dismantling the Housing

5.1.1 *Front panel (102)*

- Pull out the mains plug and place the instrument to the rear for the wide of the front panel
- Unscrew both screws (type Ejot 101) at the lower rim of front panel (use a small Phillips screw driver)
- Pull the panel's lower rim a little to front (but no more than 15° to avoid the breaking off of the plastic hooks at the upper rim)
- Push the front panel in this position to the top to unlock its casing connection and remove the panel in front of the unit
- Reassemble the front panel analogously in reverse order and press the lower rim tight to the casing when refitting the Ejot screws (but don't tighten the Ejot screws too much to avoid an overscrewing of the casing's plastic thread)

5.1.2 *Lid (210)*

- Open the lid and pull out the mains plug
- Unscrew both threaded hinge bolts (214), remove them together with bushings (212), spring washers (213) and rubber O-rings (215) and take off the lid
- Reassemble the lid analogously in reverse order (don't tighten the bolts too much, to avoid a squeezing off of the O-rings)

5.1.3 *Dismantling the Casing (205)*

- Open the lid and pull out the mains plug
- Unscrew the rotor and remove it from the motor shaft
- Dismantle front panel and lid - see 5.1.1 and 5.1.2
- Remove both Phillips screws (204) from bottom plate in front and lateral from armored chamber
- Disconnect the mains cable from terminal **XA** on main board and pull off the grounding plug
- Pick up the front panel, turn it to 90° and place it in front of armored chamber
- Press the casing upwards and remove it from the bottom plate passing the front panel in vertical position
- Reassemble the instrument analogously in reverse order

5.2 Replacement of Electrical Components

5.2.1 Fuses on Main Board (113) replacement

- Dismantle the front panel (see 5.1.1)
- Check the micro fuses and if necessary replace them by equivalent and undamaged parts
- Perform a test run and search for blowing cause
- Reassemble the device analogously in reverse order

5.2.2 NV-RAM on Main Board (112)

- Dismantle the front panel (see 5.1.1)
- ATTENTION - CMOS components! Discharge your body before handling! Notice correct position of NV-RAM (8 pins) and pull carefully out of socket
- Reinsert the new NV-RAM correctly
- Reassemble the device analogously in reverse order reconnect it to power and perform a test run

5.2.3 Main Board Replacement (110)

ATTENTION! The key and indication board is part of the main board and cannot be ordered separately!

- Dismantle the front panel (see 5.1.1)
- Disconnect plug connections for lid switches **XB**, protecting earth conductor **PE**, and unscrew the lines for lid solenoid **XD**, motor **XC** and mains supply **XA**
- Remove all screwing of the main and indication board (Ejot type 111 and 122) with fiber washers (121) and take out both boards
- Touch a grounded receptacle to discharge your body before touching the sensitive CMOS components! Take a new NV-RAM (112) out of box (or re-use the old but trouble-free component) and insert it into the socket of the new main board (if necessary, remove a placed but non programmed NV-RAM before)
- Place the parts of the new board correctly and mount it with all screws and fibre washers
- Before assembling the front panel check the trigger function of all keys and correct the board mounting if necessary
- Do not mix up disconnected cables during re-connection!
- Reassemble the device in reverse order and perform a test run, making sure the drive turns in the right direction (see imprinted arrow on rim of rotor chamber)!

5.3 Replacement of Drive Components

5.3.1 Disassembly of Drive Motor (310)

- Remove the casing (see 5.1.3)
- Disconnect the motor leads from terminal **XC** and pull off the plug connectors from the capacitor (327)
- Take the leads out of the cable holder (308)
- Unscrew the 3 nuts (313) and remove them together with the lock washers (314)
- Lift the motor out of the rubber mounts and remove the motor from the bottom plate
- Reassemble the motor analogously in reverse order and tighten the 3 nuts with use of torque key (5Nm) and secure them with locking lac
- Reassemble the device in reverse order
- Perform a test run and check the sense of rotation (see imprinted arrow direction on casing)

5.3.2 Motor supports (316)

All 3 rubber supports (316) have to be replaced at the same time and at least every three years!
By the way the 6 double-sided sandpaper discs (315) must be exchanged, too.

- Unscrew the drive motor (see 5.3.1), hold it with one hand and lay the armored chamber together with motor onto the side
- Pull the motor from the supports and lay it carefully onto the side
- Remove the 3 screws (224) from the bottom plate and take out the rubber supports together with sand paper discs (315)
- Install the new rubber mounts together with new sandpaper disks, put the lock washers in place, tighten the screws evenly and secure them with screw locking lac
- Put the unit again onto its feet, mount sandpaper disc, motor and lock washer and tighten the 3 nuts evenly by use of a torque key (5 Nm) and secure them with screw locking lac
- Reassemble the device in reverse order
- At last perform a test run

5.4 Replacement of Mechanical Components

5.4.1 Lid Lock Assemblies (300)

ATTENTION!

Both lid lock assemblies inclusive micro switches are combined to one spare part and cannot be ordered separately!

- Dismantle the casing (see 5.1.3)
- Disconnect the leads of the lid solenoids from terminal **XD** and pull out the plug **XB** for the micro switches
- Unscrew both upper screws (305) of the lid lock assemblies' attachment from the inside of the armored chamber and the lower Ejot screws (304) from the outer side
- Push down the levers of micro switches, guide the micro switches through the openings of the armored chamber and remove both lid lock assemblies completely with rubber base plates
- Reinstall the new lid lock assemblies analogously in reverse order and secure the thread of all upper fixing screws (305) with Loctite 221!
- Reassemble the device in reverse order
- Check the lid's correct closing and self-acting opening functions after the correct installation and replace the rubber profile (206)

5.5 Service Kit for Clinifuge

This service kit includes all parts which have to replaced after termination of 10000 cycles. The kit includes different NV-Rams which are destinated for the use of the referring control program (signification of micro controller No.) on the specific main board.

ATTENTION! When changing the NV-RAM it is absolutely necessary to insert the right one into the main board with the right micro controller No.! Misuse can lead to main board destruction!

The specific variants can be identified as follows:

Cat. No. of unit	Mains connection	NV-RAM signification	Controller signification	Additional identifying information and further notes
3538	120V/50Hz	1066 V02	0474	main board 14 #150076 or main board 178 #150178

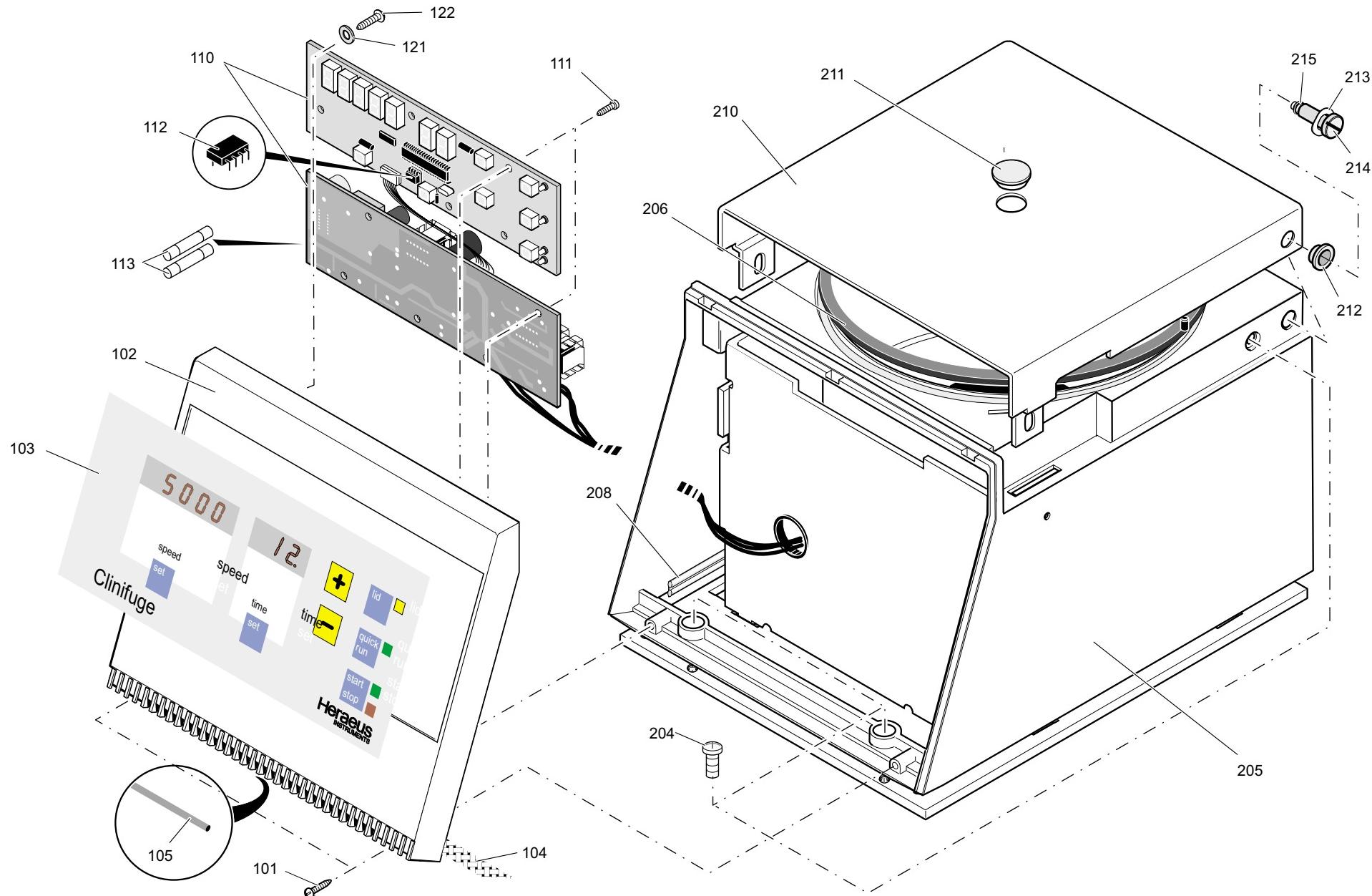
5.6 Dismantling and assembling the rotor

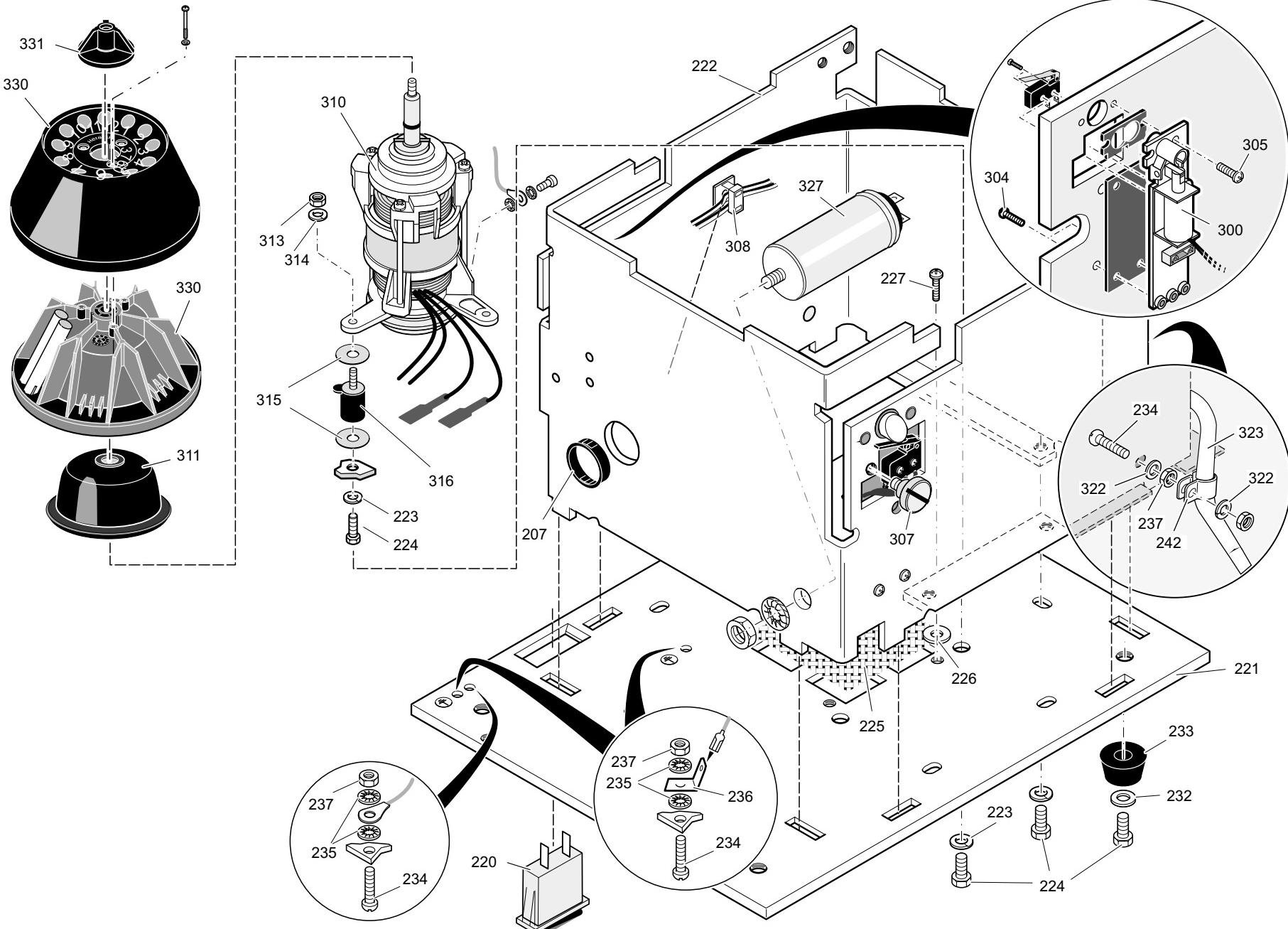
After removing the rotor nut, the rotor can be pulled vertically from the motor shaft. The rotor has to be disassembled in order to clean or insert the adaptor #3761 and #3762 or the rubber pads #3762.

To do this, remove the three fastening screws using a Phillips screwdriver. With your two index fingers reach into the opposite container bores and applying slight pressure with your thumbs on the rotor hub let the two rotor shells come apart from each other.

When putting the two rotor parts together, care is to be taken that the journals of the upper shell grip exactly into the grooves of the lower shell. By pressing slightly, both shells audibly click together. Following this the halves are to be screwed together again.

After the rotor fastening nut has been tightened for the first time the rotor screws are to be tightened again.





Spare-Part-List

Kendro Laboratory Products

Plant Osterode

75003538_01

CLINIFUGE 120V/60HZ BAXTER

from Serial-No. 201649

to Serial-No. 40102340

Index	Partno.	Text
00101	20460133	SCREW 3X14
00102	20022598	FRONT PANEL
00103	20022900	KEY FOIL
00104	20022616	WIRE NETTING
00105	20290521	SEAL (FOAM RUBBER)
00110	20150076	MAIN BOARD
00111	20460137	SCREW 3X8
00112	70901066	NV-RAM CLINIFUGE
00113	20230189	FUSE 6,25 A SLOW
00121	20250031	WASHER
00122	20460132	SCREW 3,5 X 8
00204	20460088	SCREW M5 X 8
00205	20020726	HOUSING
00206	20020717	SEAL
00207	20220561	BUSHING
00208	20290473	SEALING
00210	70020803	LID
00211	20050543	WINDOW
00212	20350211	COLLAR
00213	20480250	SPRING WASHER
00214	20037565	SCREW
00215	20290419	O - RING 4,47 X 1,78
00220	20180581	MAINS SWITCH
00221	70022871	BOTTOM PLATE
00222	70022870	ARMED BOWL
00223	20480251	SECURING WASHER
00224	20430216	SCREW M 6 X 12
00225	20022867	WIRE CLOTH
00226	20480224	WASHER A 4,3
00227	20460092	ALLEN SCREW M4 X 6
00232	20480157	WASHER
00233	20049932	FOOT
00234	20460112	SCREW M 4 X 16
00235	20480108	FAN WASHER A 4,3
00236	20220510	DOUBLE CONNECTOR MALE
00237	20420076	HEXAGONAL NUT M4
00300	70003621	LID LOCK ASSY. CPL.
00304	20460138	SCREW 4X10

Spare-Part-List

Kendro Laboratory Products

Plant Osterode

75003538_01

CLINIFUGE 120V/60HZ BAXTER

from Serial-No. 201649

to Serial-No. 40102340

Index	Partno.	Text
00305	20440295	SCREW M4X16
00307	20022873	SCREW
00308	20220416	CABLE-CLIP
00310	20210275	MOTOR
00311	20020738	MOTOR COVER
00313	20420070	NUT M 6
00314	20480251	SECURING WASHER
00315	10104080	WASHER (SAND)
00316	20022874	ANTIVIBRATION MOUNT
00322	20480130	WASHER 4,3
00323	70901059	MAINS CABLE
00324	20220286	GRIP 6,5
00325	20480244	LOCK WASHER
00327	20540344	CAPACITOR
00330	70901069	SERVICE KIT CLINIFUGE/MEDIFUGE
00331	20053358	ROTOR NUT

Spare-Part-List

Kendro Laboratory Products

Plant Osterode

75003538_02

CLINIFUGE 120V/60HZ BAXTER

from Serial-No. 40102341

to Serial-No.

Index	Partno.	Text
00101	20460133	SCREW 3X14
00102	20022598	FRONT PANEL
00103	20022900	KEY FOIL
00104	20022616	WIRE NETTING
00105	20290521	SEAL (FOAM RUBBER)
00110	20150178	MAINBOARD 120 V
00111	20460137	SCREW 3X8
00112	70901066	NV-RAM CLINIFUGE
00113	20230189	FUSE 6,25 A SLOW
00121	20250031	WASHER
00122	20460132	SCREW 3,5 X 8
00204	20460088	SCREW M5 X 8
00205	20020726	HOUSING
00206	20020717	SEAL
00207	20220561	BUSHING
00208	20290473	SEALING
00210	70020803	LID
00211	20050543	WINDOW
00212	20350211	COLLAR
00213	20480250	SPRING WASHER
00214	20037565	SCREW
00215	20290419	O - RING 4,47 X 1,78
00220	20180581	MAINS SWITCH
00221	70022871	BOTTOM PLATE
00222	70022870	ARMED BOWL
00223	20480251	SECURING WASHER
00224	20430216	SCREW M 6 X 12
00225	20022867	WIRE CLOTH
00226	20480224	WASHER A 4,3
00227	20460092	ALLEN SCREW M4 X 6
00232	20480157	WASHER
00233	20049932	FOOT
00234	20460112	SCREW M 4 X 16
00235	20480108	FAN WASHER A 4,3
00236	20220510	DOUBLE CONNECTOR MALE
00237	20420076	HEXAGONAL NUT M4
00300	70003621	LID LOCK ASSY. CPL.
00304	20460138	SCREW 4X10

Spare-Part-List**Kendro Laboratory Products**

Plant Osterode

75003538_02**CLINIFUGE 120V/60HZ BAXTER**

from Serial-No. 40102341

to Serial-No.

Index	Partno.	Text
00305	20440295	SCREW M4X16
00307	20022873	SCREW
00308	20220416	CABLE-CLIP
00310	20210275	MOTOR
00311	20020738	MOTOR COVER
00313	20420070	NUT M 6
00314	20480251	SECURING WASHER
00315	10104080	WASHER (SAND)
00316	20022874	ANTIVIBRATION MOUNT
00322	20480130	WASHER 4,3
00323	70901059	MAINS CABLE
00324	20220286	GRIP 6,5
00325	20480244	LOCK WASHER
00327	20540344	CAPACITOR
00330	70901069	SERVICE KIT CLINIFUGE/MEDIFUGE
00331	20053358	ROTOR NUT

Clinifuge 110V 60Hz			Cat. No. 75003538			
Index	Cat-no.	Description	Index	Cat-no.	Description	
101	20460133	Screw 3x14	313	20420070	Nut M6	
102	20022598	Front Panel	314	20480251	Securing washer	
103	20022901	Key Foil	315	20480301	Emery paper washer	
104	20022616	Wire Netting	316	20022874	Antivibration mounts	
105	20290521	Seal (foam rubber)	317	20480251	Securing washer	
110	20150178	Main Board	318	20430216	Screw M6x12	
111	20460137	Screw M3x8	321	20460094	Screw M4x8	
112	70901066	Nv-Ram	322	20480108	Fan washer A4,3	
113	20230189	Fuse 6.25A Slow	323	20901059	Mains Cable	
114	20230189	Fuse 6.25A Slow	324	20220286	Grip 6,5	
115	20250031	Washer	325	20480244	Fan Washer	
121	20250031	Washer	326	20460094	Screw M4x8	
122	20460132	Screw 3.5x8	327	20540344	Capacitor	
204	20460088	Allen Screw M5x8	328	20480180	Fan Washer	
205	20020726	Housing	329	20480130	Washer 4,3	
206	20020717	Seal	330	75003760	Rotor Complete	
207	20220561	Bushing	331	20053358	Rotor Nut	
208	20290473	Sealing		20490376	Drive Pin	
210	70020803	Lid		70901069	Clinifuge Kit	
211	20050543	Window				
212	20350211	Collar				
213	20480250	Spring Washer				
214	70037565	Lid Screw				
215	20290419	O-ring				
220	20180581	Main switch				
221	70022871	Bottom plate				
222	70022870	Armoured bowl				
223	20480251	Securing washer				
224	20430216	Screw M6x12				
225	20022867	Wire cloth				
226	20480224	Washer A4,3				
227	20460092	Allen Screw M4x6				
231	20430216	Screw M6x12				
232	20480157	Washer				
233	20049932	Foot				
234	20460112	Screw M4x16				
235	20480108	Fan washer A4,3				
236	20220510	Double connector male				
237	20420076	Hex. Nut M4				
300	20003621	Lid Latch Assy.				
302	20480108	Fan washer A4,3				
303	20420076	Hex. Nut M4				
304	20460138	Screw M4x10				
305	20460094	Screw M4x8				
306	20020774	Basis Plate				
307	20022873	Screw				
308	20220416	Cable clip				
301	20210275	Motor				
311	20020738	Motor Cover				

Revised 2/15/02

Bold = SPL Yes

Spare-Part-List

Kendro Laboratory Products

Plant Osterode

75003539.01

CLINIFUGE 120V 60HZ HI

from Serial-No. 201649

to Serial-No. 40102340

Index	Partno.	Text
00101	20460133	SCREW 3X14
00102	20022598	FRONT PANEL
00103	20022901	OVERLAY CLINIFUGE
00104	20022616	WIRE NETTING
00105	20290521	SEAL (FOAM RUBBER)
00110	20150076	MAIN BOARD
00111	20460137	SCREW 3X8
00112	70901066	NV-RAM CLINIFUGE
00113	20230189	FUSE 6,25 A SLOW
00121	20250031	WASHER
00122	20460132	SCREW 3,5 X 8
00204	20460088	SCREW M5 X 8
00205	20020726	HOUSING
00206	20020717	SEAL
00207	20220561	BUSHING
00208	20290473	SEALING
00210	70020803	LID
00211	20050543	WINDOW
00212	20350211	COLLAR
00213	20480250	SPRING WASHER
00214	20037565	SCREW
00215	20290419	O - RING 4,47 X 1,78
00220	20180581	MAINS SWITCH
00221	70022871	BOTTOM PLATE
00222	70022870	ARMED BOWL
00223	20480251	SECURING WASHER
00224	20430216	SCREW M 6 X 12
00225	20022867	WIRE CLOTH
00226	20480224	WASHER A 4,3
00227	20460092	ALLEN SCREW M4 X 6
00232	20480157	WASHER
00233	20049932	FOOT
00234	20460112	SCREW M 4 X 16
00235	20480108	FAN WASHER A 4,3
00236	20220510	DOUBLE CONNECTOR MALE
00237	20420076	HEXAGONAL NUT M4
00300	70003621	LID LOCK ASSY. CPL.
00304	20460138	SCREW 4X10

Seite 1

Spare-Part-List**Kendro Laboratory Products**

Plant Osterode

75003539.01**CLINIFUGE 120V 60HZ HI**

from Serial-No. 201649

to Serial-No. 40102340

Index	Partno.	Text
00305	20440295	SCREW M4X16
00307	20022873	SCREW
00308	20220416	CABLE-CLIP
00310	20210275	MOTOR
00311	20020738	MOTOR COVER
00313	20420070	NUT M 6
00314	20480251	SECURING WASHER
00315	10104080	WASHER (SAND)
00316	20022874	ANTIVIBRATION MOUNT
00322	20480130	WASHER 4,3
00323	70901059	MAINS CABLE
00324	20220286	GRIP 6,5
00325	20480244	LOCK WASHER
00327	20540344	CAPACITOR
00330	70901069	SERVICE KIT CLINIFUGE/MEDIFUGE
00331	20053358	ROTOR NUT

Spare-Part-List**Kendro Laboratory Products**

Plant Osterode

75003539 . 02**CLINIFUGE 120V 60HZ HI**

from Serial-No. 40102341

to Serial-No.

Index	Partno.	Text
00101	20460133	SCREW 3X14
00102	20022598	FRONT PANEL
00103	20022901	OVERLAY CLINIFUGE
00104	20022616	WIRE NETTING
00105	20290521	SEAL (FOAM RUBBER)
00110	20150178	MAINBOARD 120 V
00111	20460137	SCREW 3X8
00112	70901066	NV-RAM CLINIFUGE
00113	20230189	FUSE 6,25 A SLOW
00121	20250031	WASHER
00122	20460132	SCREW 3,5 X 8
00204	20460088	SCREW M5 X 8
00205	20020726	HOUSING
00206	20020717	SEAL
00207	20220561	BUSHING
00208	20290473	SEALING
00210	70020803	LID
00211	20050543	WINDOW
00212	20350211	COLLAR
00213	20480250	SPRING WASHER
00214	20037565	SCREW
00215	20290419	O - RING 4,47 X 1,78
00220	20180581	MAINS SWITCH
00221	70022871	BOTTOM PLATE
00222	70022870	ARMED BOWL
00223	20480251	SECURING WASHER
00224	20430216	SCREW M 6 X 12
00225	20022867	WIRE CLOTH
00226	20480224	WASHER A 4,3
00227	20460092	ALLEN SCREW M4 X 6
00232	20480157	WASHER
00233	20049932	FOOT
00234	20460112	SCREW M 4 X 16
00235	20480108	FAN WASHER A 4,3
00236	20220510	DOUBLE CONNECTOR MALE
00237	20420076	HEXAGONAL NUT M4
00300	70003621	LID LOCK ASSY. CPL.
00304	20460138	SCREW 4X10

Spare-Part-List**Kendro Laboratory Products**

Plant Osterode

75003539 . 02**CLINIFUGE 120V 60HZ HI**

from Serial-No. 40102341

to Serial-No.

Index	Partno.	Text
00305	20440295	SCREW M4X16
00307	20022873	SCREW
00308	20220416	CABLE-CLIP
00310	20210275	MOTOR
00311	20020738	MOTOR COVER
00313	20420070	NUT M 6
00314	20480251	SECURING WASHER
00315	10104080	WASHER (SAND)
00316	20022874	ANTIVIBRATION MOUNT
00322	20480130	WASHER 4,3
00323	70901059	MAINS CABLE
00324	20220286	GRIP 6,5
00325	20480244	LOCK WASHER
00327	20540344	CAPACITOR
00330	70901069	SERVICE KIT CLINIFUGE/MEDIFUGE
00331	20053358	ROTOR NUT

TECHNICAL BULLETINS

Clinifuge

Table of Contents - Section 7

TB. No.	Change	Date	Page	Edition
260/B	New rotor locking nut	11/93	7 - 2	01
261/B	Bushing attachment of motor shaft	11/93	7 - 3	01
303	New micro switch for lid lock (with metal lever)	06/98	7 - 4	01
306	Screwing On of Rotor Parts (#3760)	08/98	7 - 5	01

Technical Bulletin 260B

Clinifuge

1. **Reason for change:** Quality improvement of the locking nut Cat. No. 20053358

Notice: The material of the thread in the locking nut is changed from yellow brass in fine steel. Cat. No. is the same

Notice: The change is effective beginning with serial no. 201649

2. **Validity:** The locking nut must be changed if the threads are worn or damaged

Technical Bulletin 261B

Clinifuge

1. Engineering change:

A steel bushing is attached to the motor shaft underneath the cross-pin

2. Reason for change:

This improvement will prevent the cross-pin from being bent by heavy tightening of the rotor locking nut.

Notice:

The change is effective beginning with serial no. 205836

3. Validity:

The recommended measure is to perform only by a bent or broken cross-pin

4. Procedure:

In the event of a bent or broken cross-pin, a motor exchange is necessary.

It's not possible to change only the cross-pin in the field.

Motor Cat.-No. 20210275 is the same.

ATTENTION - important note!

The motor cover must be replaced with the motor.

Order motor cover - catalog number 20020738.

Technical Bulletin No. 303

1. Engineering Change

Introduction of a new micro switch for the lid locking systems of all small centrifuges.

2. Reference to Units

Introduction ex works after using up the old stocked micro switches.

3. Reason for change

The old micro switch with plastic lever is no longer produced. The new micro switch has a metal lever and also improved conditions (closeness) against environmental influences.

4. Validy

This change is only to perform on units before the above mentioned units, if the micro switch should be defective (e.g. in case of an „OPEn“ or „OP“ message although the lid is closed correctly).

5. Modification

See Service Manual of referring unit: Change of Components for lid lock assembly. Although some Manuals are pointing out that only the complete lid locks are available as one spare part, the new micro switch can be ordered separately, now.

Reinstall the unit accordingly to regulations!

Note!

If contrary to expectation a new micro switch should be already defective, so send it back immediately to factory for inspection!

6. Required / Outgoing Parts

Required	Number	Cat. No.	Outgoing / Change	Cat. No.
micro switch per lock (with metal lever)	1	20180557	micro switch (with plastic lever)	20180557

7. Stockage / Obsolete Parts

Old and perfect micro switches can be used up furtheron

Technical Bulletin No. 306

1. Engineering Change

Screwing on of upper and lower parts of rotor #3760.

2. Reference to Units

This change is only valid for the 120V units of Clinifuge and Labofuge 200 and is effective from in table given Serial No.'s onwards:

Model	Edition	Cat. No.	Serial No.
Clinifuge	120V 50/60Hz	75003638	261.016
	120V 50/60Hz	75003639	261.419

3. Reason for change

Safety against falling apart of both rotor shells in case of misuse.

If the rotor wing nut is not tightened and the rotor is also used with the adapters #3761 (double reducing adapters) it can happen that both rotor parts get loosen and damaged.

4. Validity

A rotor exchange is only to perform on units before the above mentioned Serial No's, if this incident should happen to a customer.

5. Modification

See appended page of important application instructions for rotor #3760!

Note!

Rotors of new units are generally delivered with built-in Monovette adapters #3761! Spare rotors incorporate no adapters at all!

6. Appendix

Title	Edition	Section Page	Original File
Important application instructions for rotor #3760	01		HS874E

7. Required / Outgoing Parts

Required	Num.	Cat. No.	Change
Plastic rotor #3760 PP consists of <ul style="list-style-type: none">• upper bowl with hold-in borings for 3 screws• lower bowl with 3 cast integral domes with threaded seat• 3 neck screws M4x20x7• 3 lock washers	1	75003760	<ul style="list-style-type: none">• 3 borings in upper bowl• 3 domes in lower bowl• added• added

8. Stockage / Obsolete Parts

Old rotors (#3760) without screwing on of its parts will be taken back for substitution.

Important application instructions for Rotor 7500 3760!



Installing the rotor

When installing the rotor, care is to be taken that the follower pin on the primary shaft is fitted accurately in the recess of the rotor provided for this purpose. In this case the upper edge of the rotor hub lies flush with the cylindrical section of the motor shaft. (The markings on the rotor hub indicate the direction of the recess.)

The rotor wing nut must always be securely fastened. Verify security of the nut regularly and retighten as required.

To operate the 750003760 rotor safely, the upper and lower shells are connected with three screws (M4 x 20).

In all cases the rotor should only be operated when screwed together!

Dismantling and assembling the rotor

After removing the rotor nut, the rotor can be pulled vertically from the motor shaft. The rotor has to be disassembled in order to clean or insert the adaptor #3761 and #3762 or the rubber pads #3762.

To do this, remove the three fastening screws using a Phillips screwdriver. With your two index fingers reach into the opposite container bores and applying slight pressure with your thumbs on the rotor hub let the two rotor shells come apart from each other.



When putting the two rotor parts together, care is to be taken that the journals of the upper shell grip exactly into the grooves of the lower shell. By pressing slightly, both shells audibly click together.

Following this the halves are to be screwed together again.

After the rotor fastening nut has been tightened for the first time the rotor screws are to be tightened again.

Limiting the loading capacity

When using containers longer than 100 mm or containers with a screw on lid whose diameter exceeds 18 mm (e.g. Monovetten® 16.5 x 92 mm) only every second bore can be used.

Service life

High performance rotors made of plastic have a limited service life.

Due to safety reasons they have to be exchanged after 10,000 cycles or after being in use for five years.

The expiry date can be seen on the date clock in the rotor lower shell. The two-digit number in the middle represents the year and the arrow points to the expiry month.

